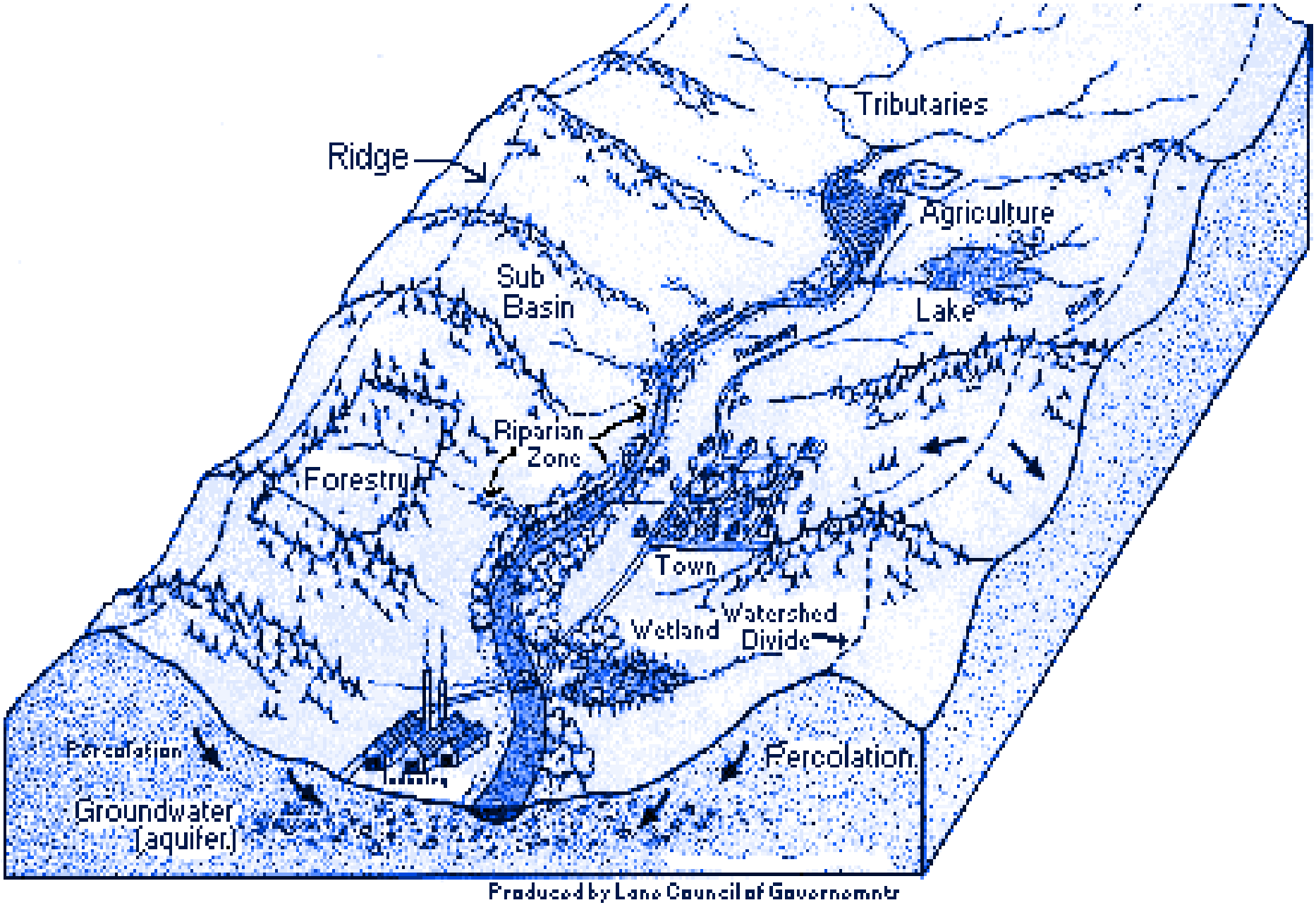
A WATERSHED VIEW



UNDERSTANDING WATERSHEDS

- Water is a vital resource
- Understand how watersheds are defined
- Impacted by natural phenomena and human activities
- Importance of a watershed view
- Mapping your watershed

WATERSHED MAPPING ACTIVITY

- Identify potential sources of pollution
- Identify monitoring sites
- Provide information to educate

WATERSHED MAPPING ACTIVITY

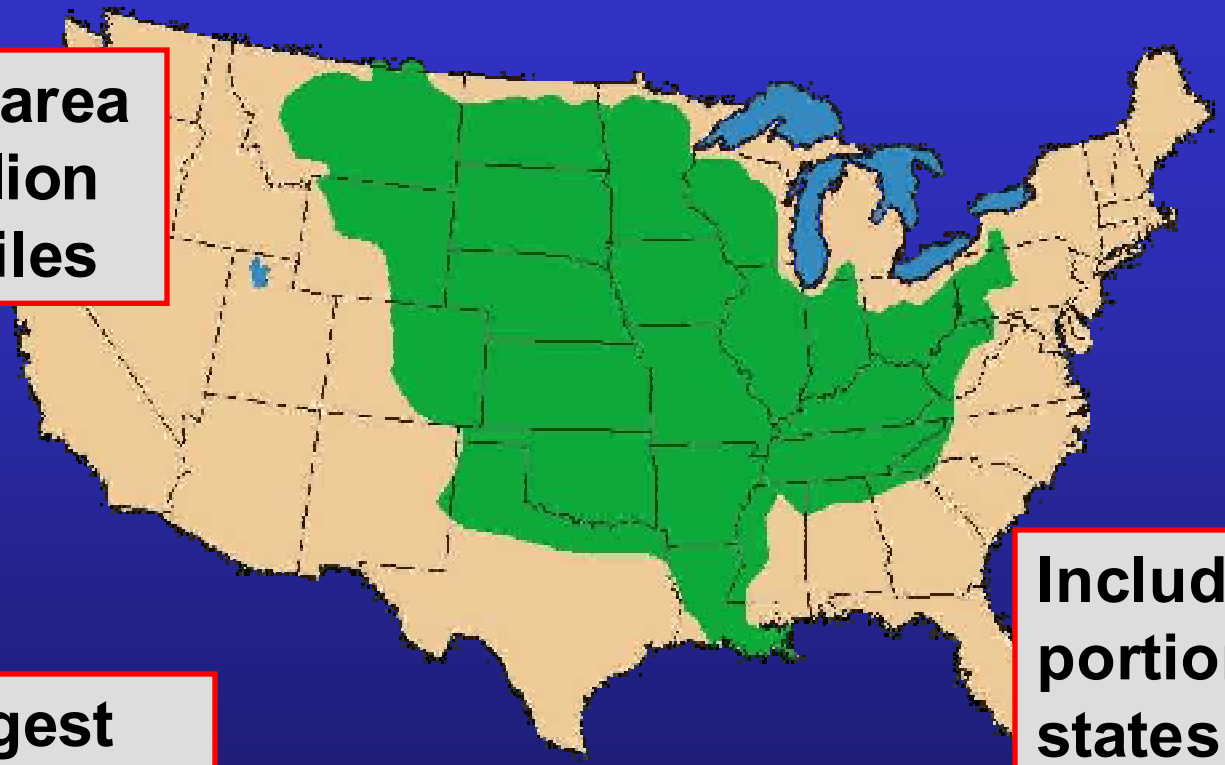
- Provide a list of potential community restoration efforts
- Provide a sense of value
- To make informed decisions

WHAT IS A WATERSHED?

- A topographically-defined area of land that drains into a particular body of water
  - Drainage basin
  - Catchment area

MISSISSIPPI RIVER WATERSHED

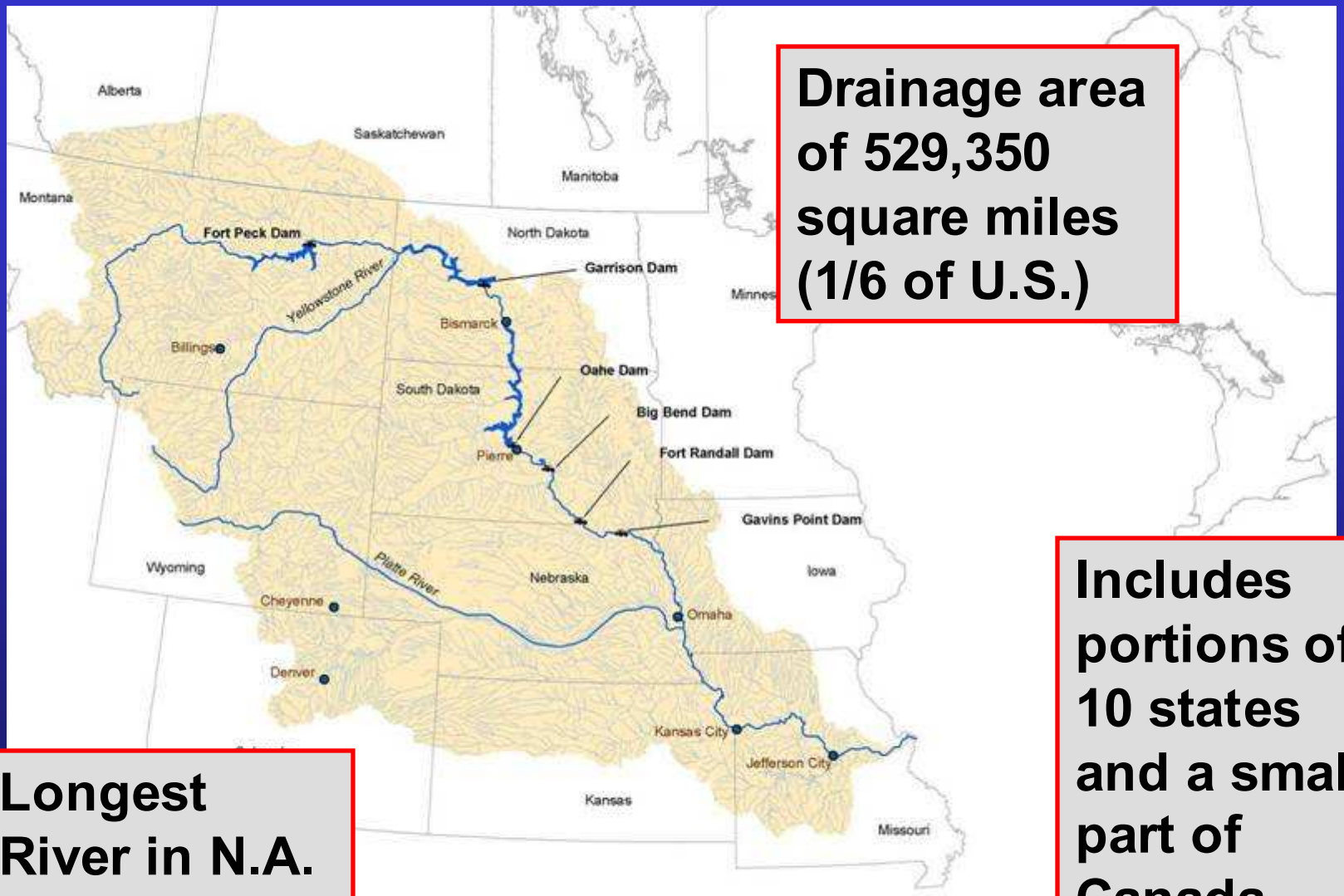
Drainage area of 1.2 million square miles



3rd largest watershed in the world

Includes portions of 30 states and a small part of Canada

MISSOURI RIVER WATERSHED

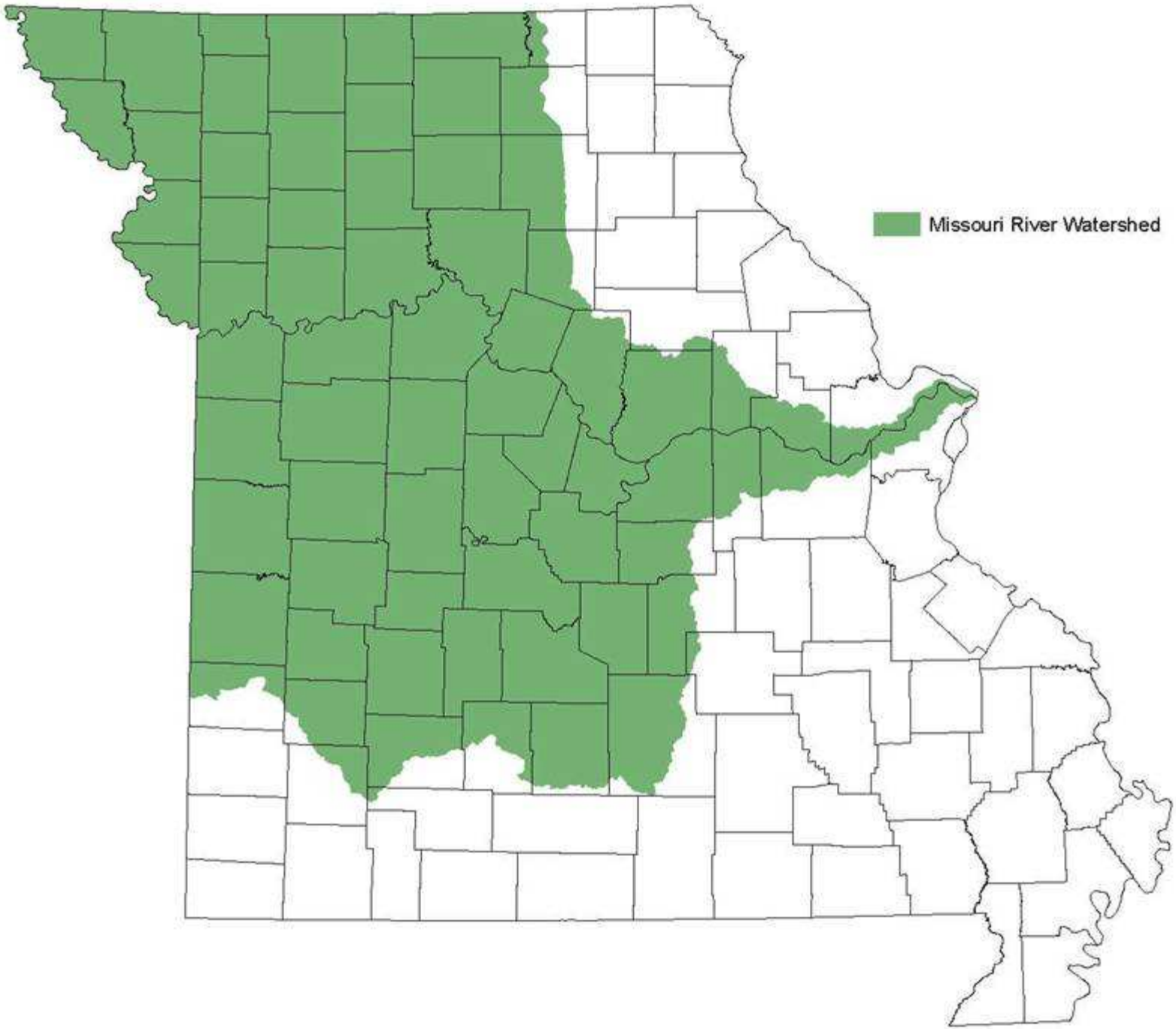


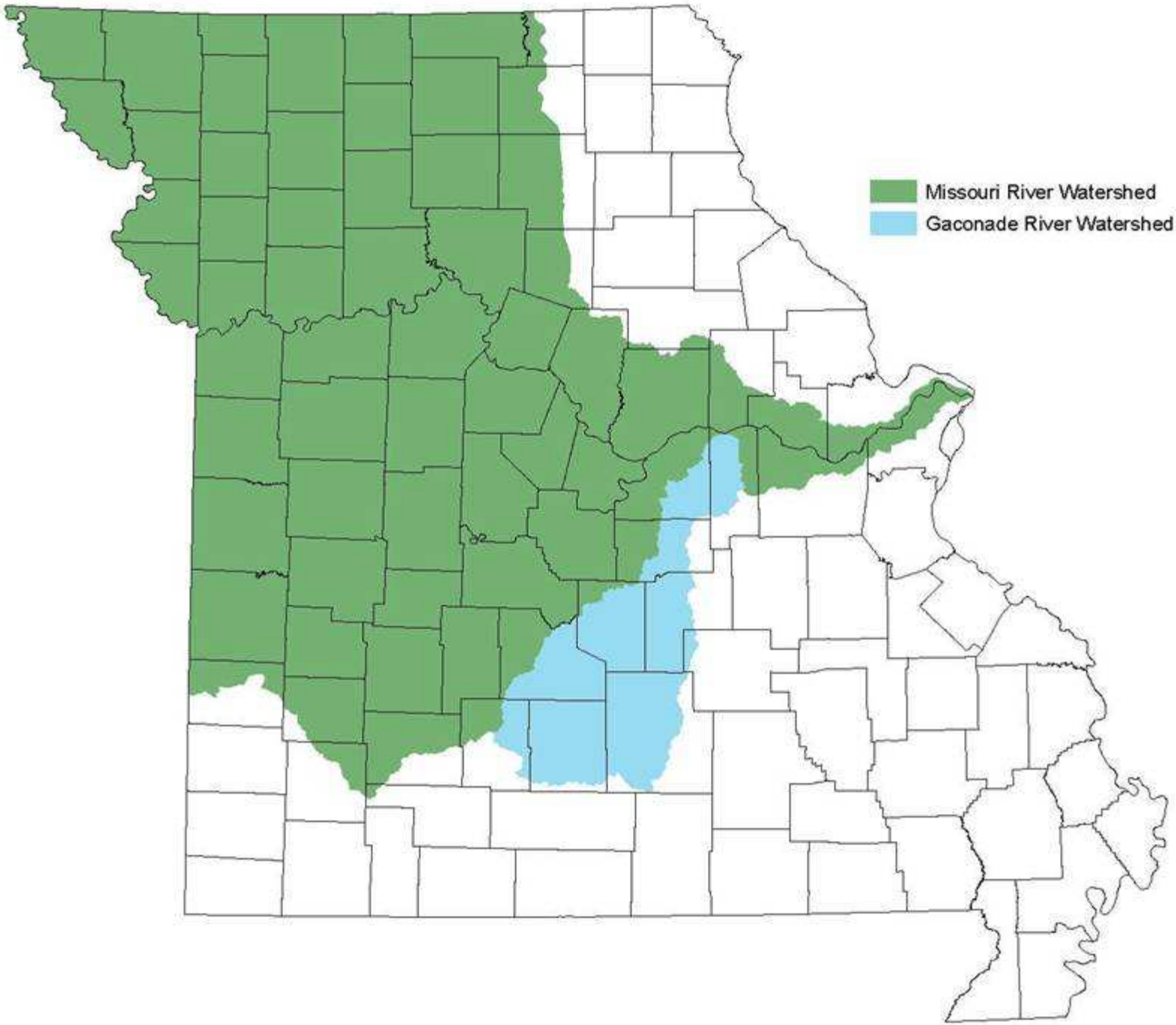
Drainage area of 529,350 square miles (1/6 of U.S.)

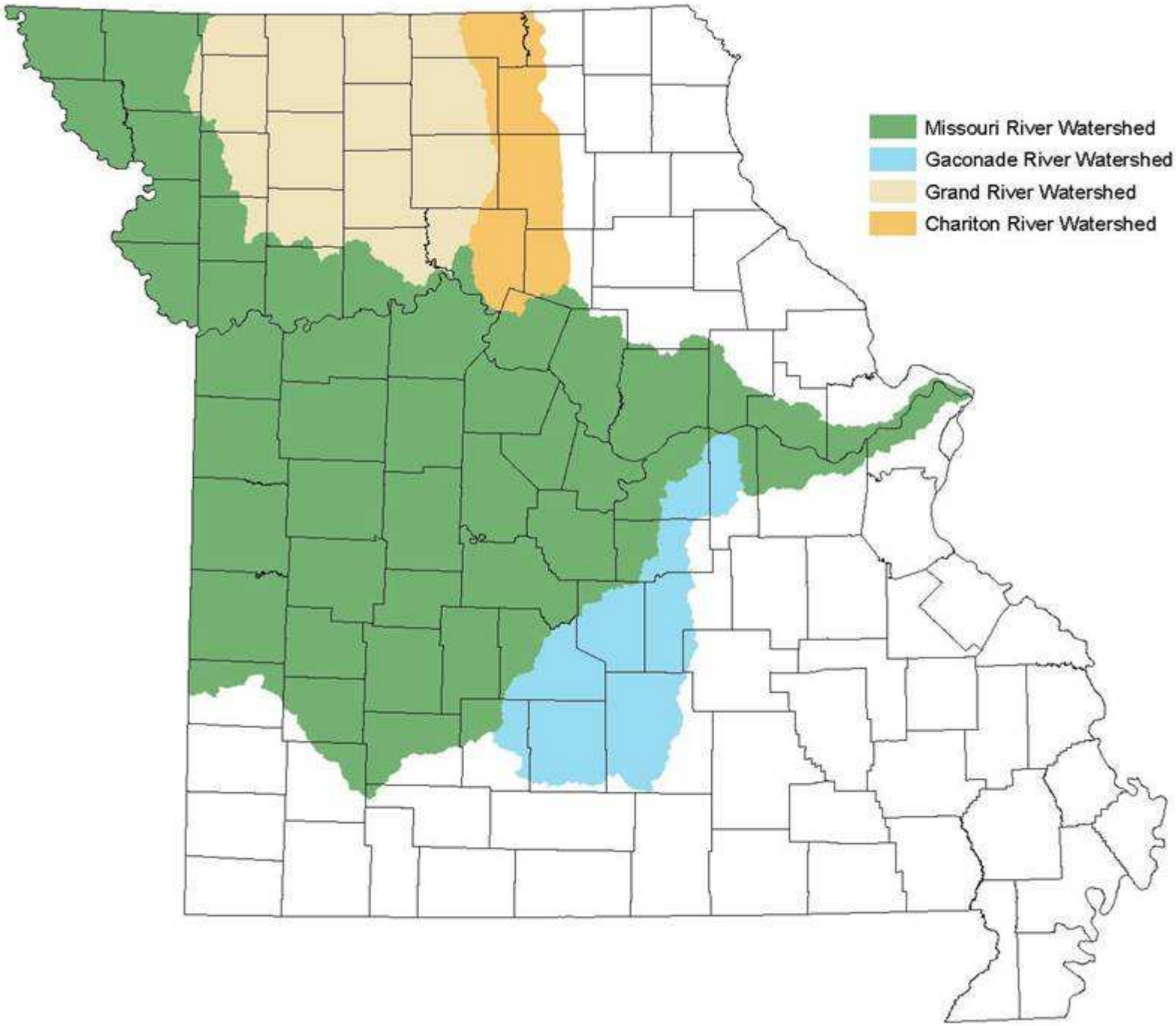
Longest River in N.A. (2,341 miles)

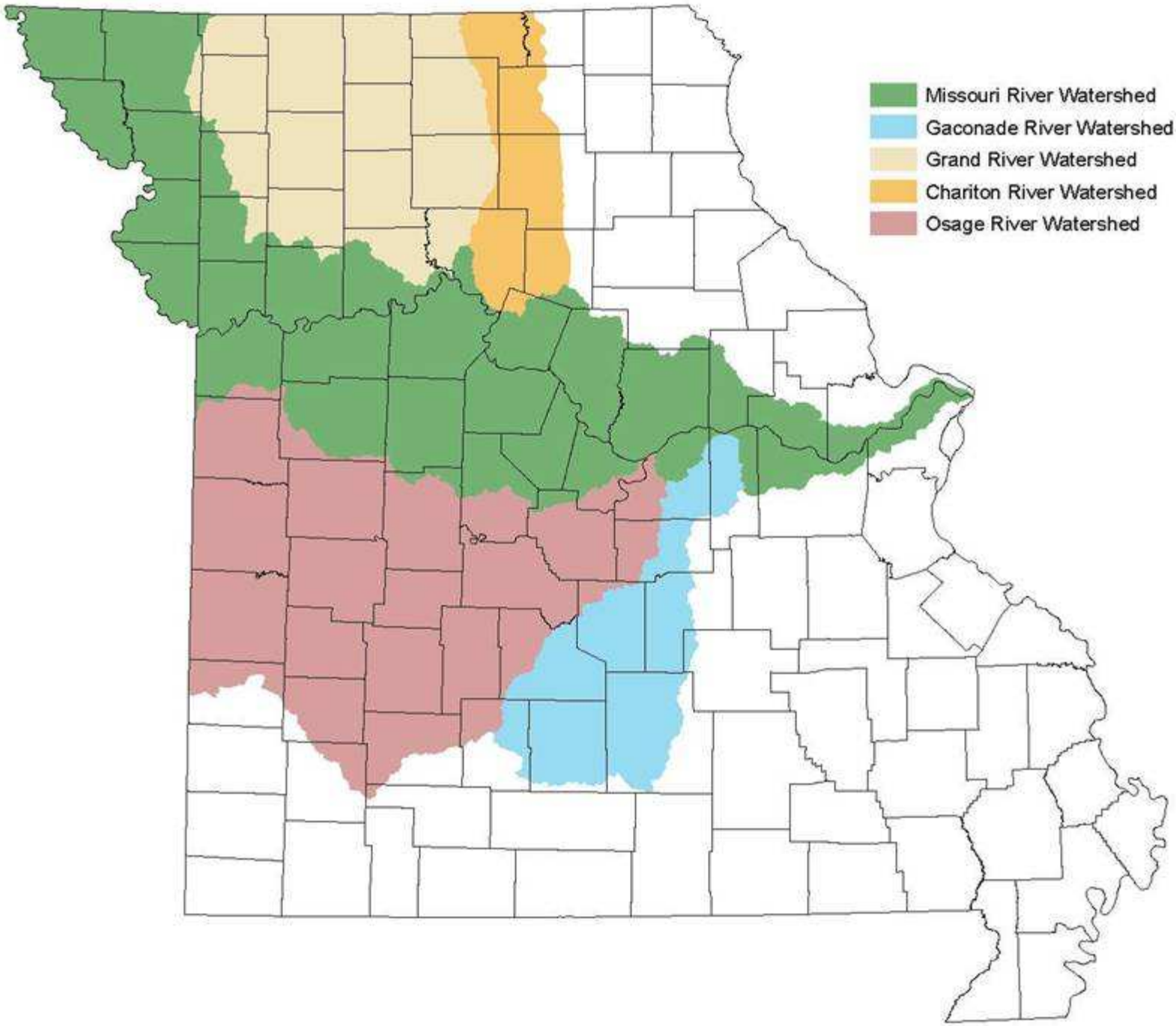
Includes portions of 10 states and a small part of Canada

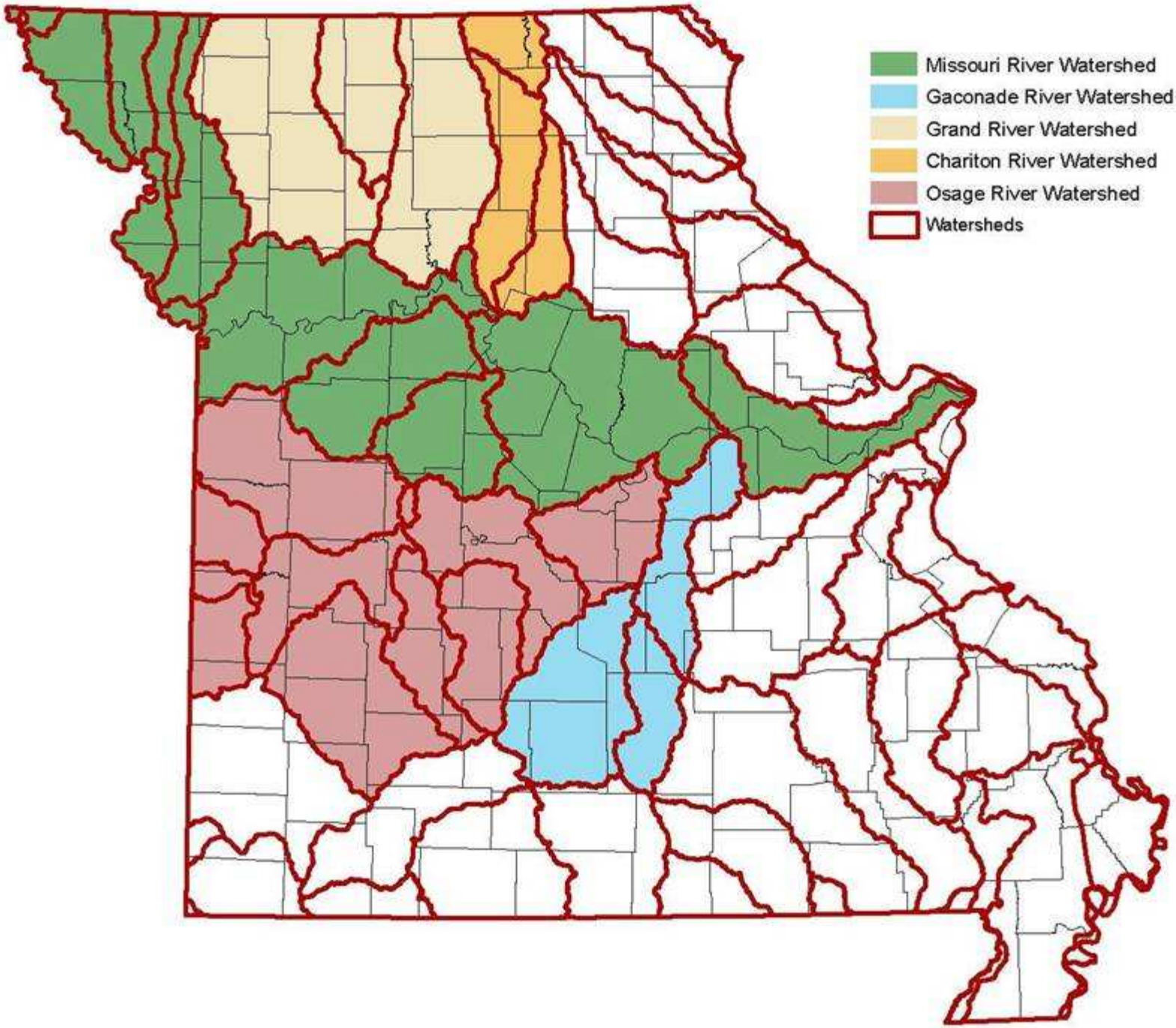
(DNR Illustration)

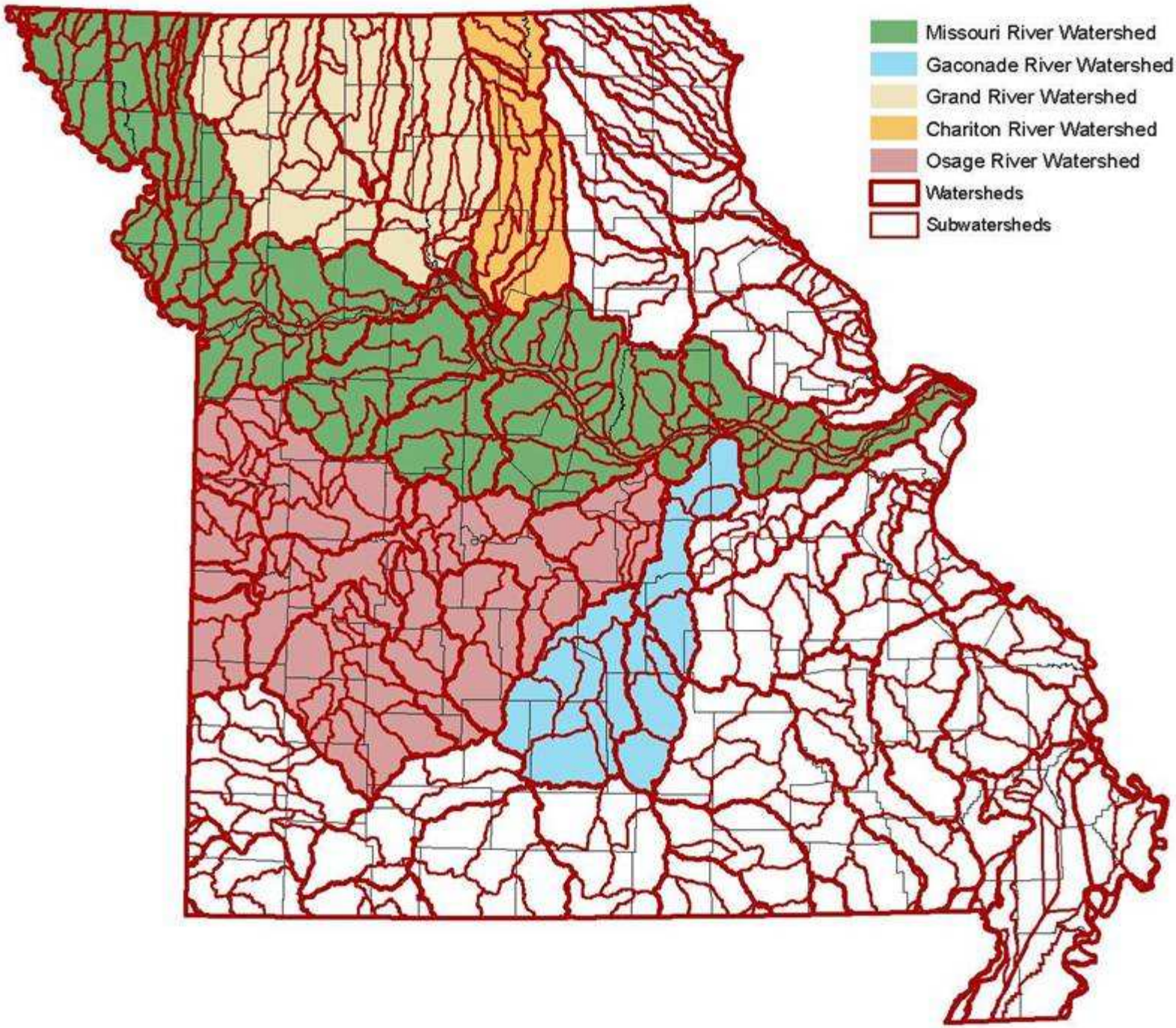

Missouri River Watershed

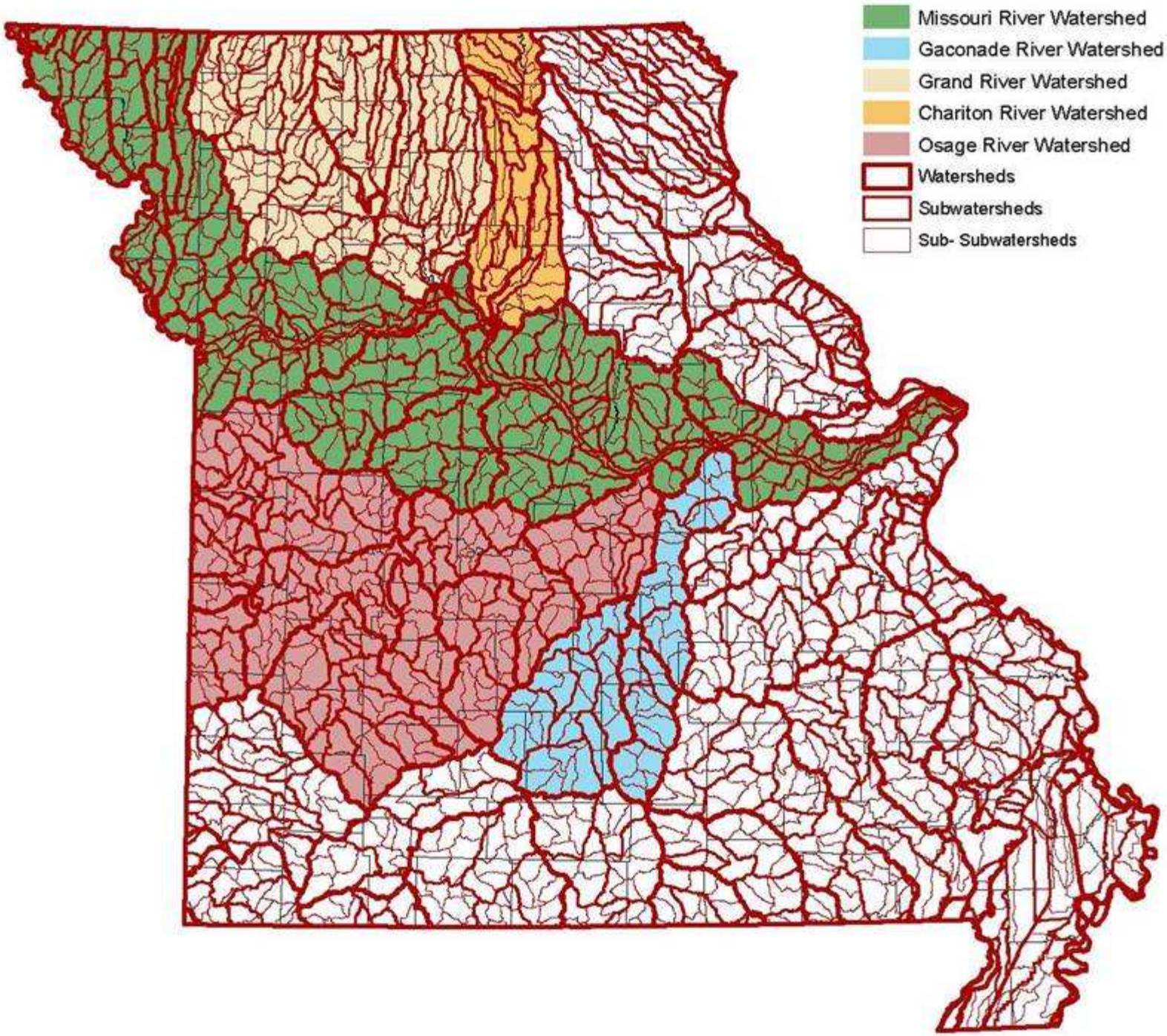

Missouri River Watershed
Gaconade River Watershed


Missouri River Watershed
Gaconade River Watershed
Grand River Watershed
Chariton River Watershed

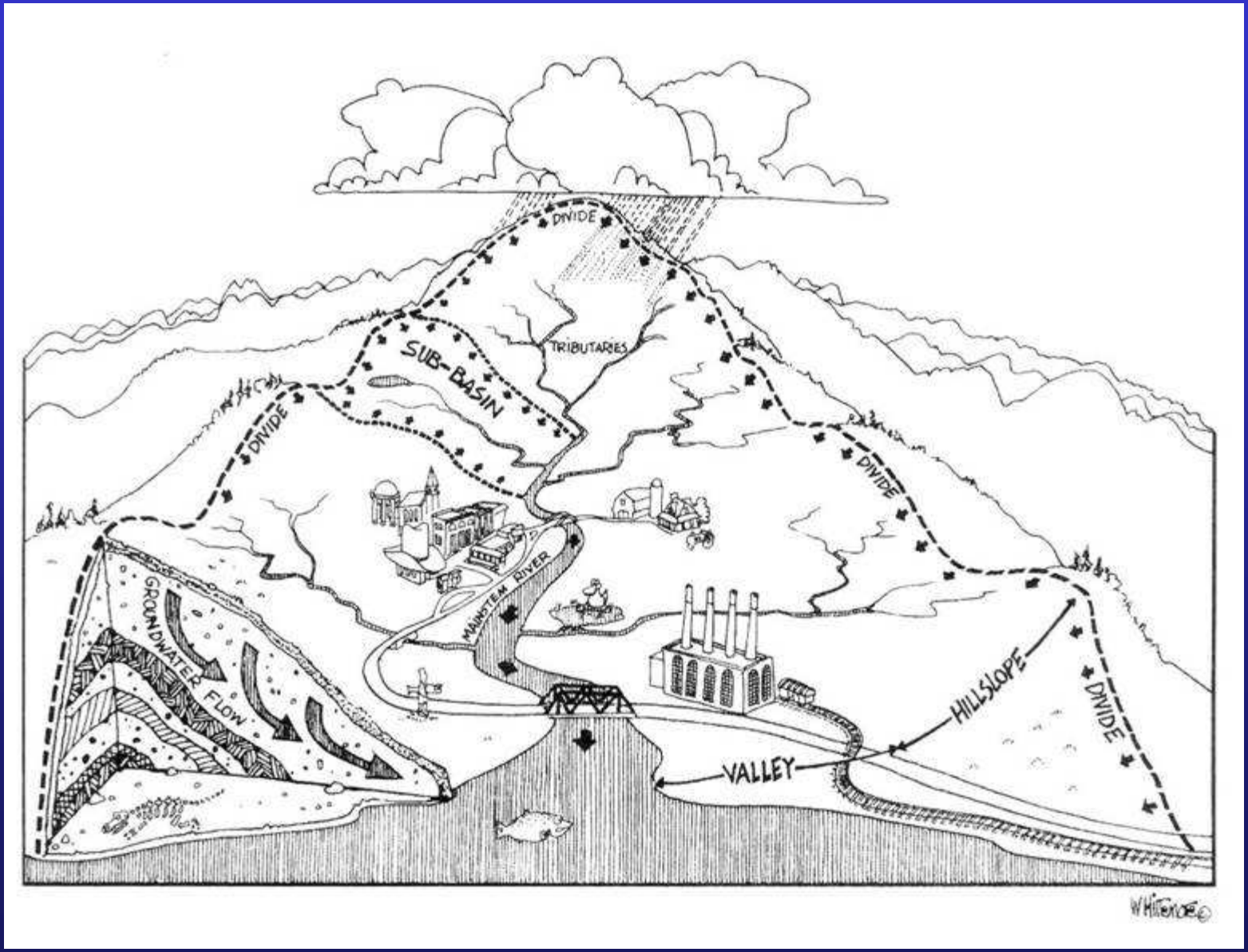

Missouri River Watershed
Gaconade River Watershed
Grand River Watershed
Chariton River Watershed
Osage River Watershed


Missouri River Watershed
Gaconade River Watershed
Grand River Watershed
Chariton River Watershed
Osage River Watershed
Watersheds


Missouri River Watershed
Gaconade River Watershed
Grand River Watershed
Chariton River Watershed
Osage River Watershed
Watersheds
Subwatersheds


Missouri River Watershed
Gaconade River Watershed
Grand River Watershed
Chariton River Watershed
Osage River Watershed
Watersheds
Subwatersheds
Sub- Subwatersheds

WATERSHEDS ARE INTERCONNECTED WATER SYSTEMS



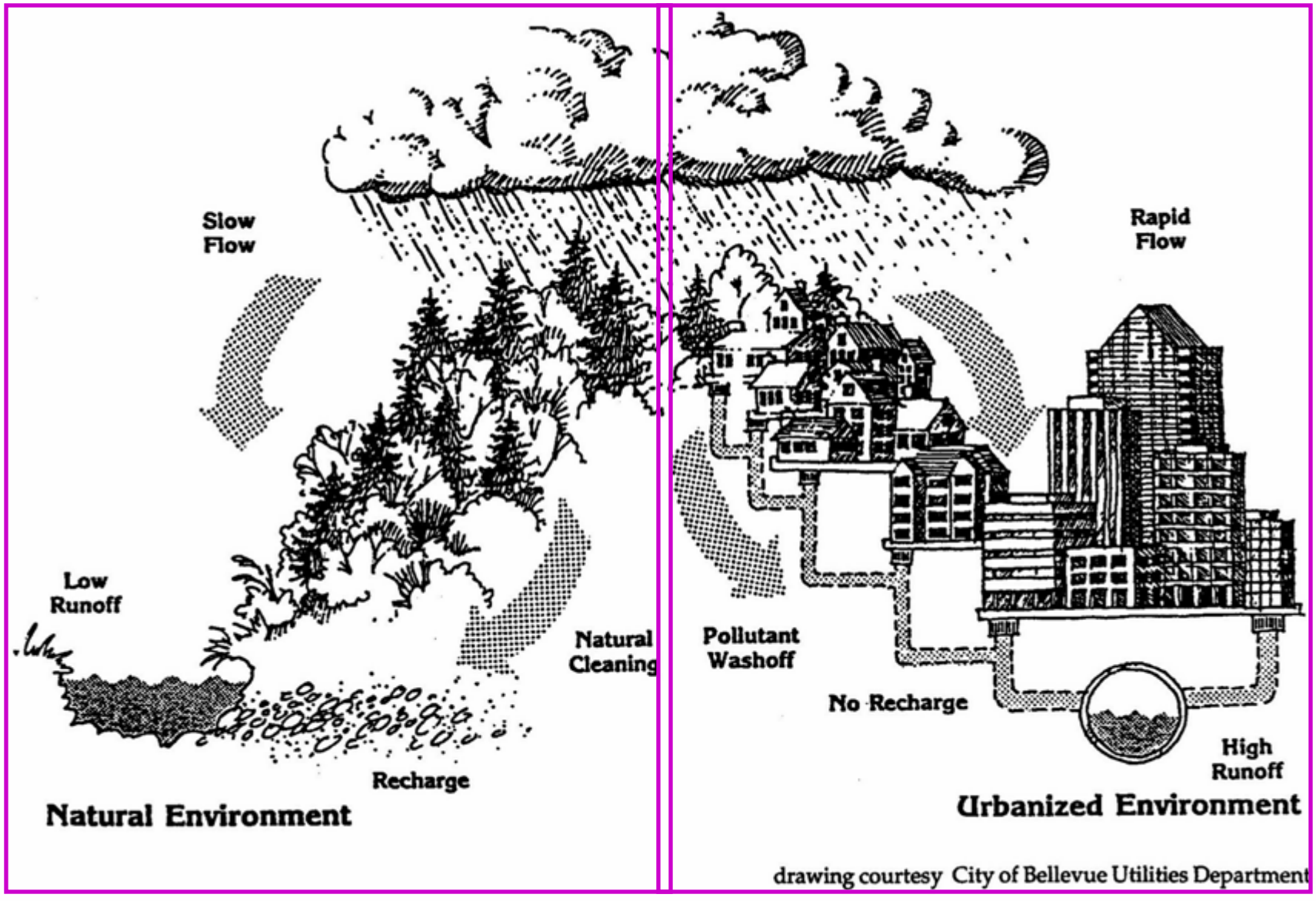
WATERSHED DYNAMICS

- All parts of a watershed are interconnected
- Water flows through a watershed
- The most pervasive threat to water quality is siltation due to runoff and soil erosion
- Land use, slope, and soil type influence runoff and erosion

WATERSHED DYNAMICS

- Disturbed areas without vegetation suffer from increased runoff and erosion
- Impervious surfaces
- Undisturbed areas, wetlands, uncompacted soils, and vegetation absorb water and slow runoff

HUMAN USES OF LAND AND WATER IMPACT WATER QUALITY



TYPES OF POLLUTANTS

- **Point source pollution**
  - like a pipe discharge

- **Nonpoint source pollution**
  - from a number of diffuse sources

  ▸ Harder to identify so more difficult to control

NONPOINT SOURCE POLLUTION

Agricultural Sources

- soil erosion
- animal waste
- fertilizer
- pesticides

NONPOINT SOURCE POLLUTION (cont.)

Urban Sources

- runoff from impervious surfaces
- fertilizers & pesticides from lawns, parks, golf courses
- sediment from construction sites
- cleaning products
- pet wastes

KNOW YOUR WATERSHED

- Understanding a watershed is essential to the interpretation of stream health and water quality

- Everything that occurs within a watershed affects water resources

- **A STREAM IS A REFLECTION OF ITS WATERSHED**

YOUR WATERSHED MAP

- Choose a manageable size
- Watershed boundaries
- Topography
- Land use

TOPOGRAPHIC MAPS

- Represent a four-sided region called a quadrangle
- Use *Contour lines* to illustrate relief
- *Symbols* show boundaries, surface features, buildings, roads, railroads, and communication features
- *Scale* represents distance

HOW DO YOU GET TOPO MAPS?

- United States Geological Survey (USGS) publishes

- Sources:
  - DNR's Division of Geological Survey & Resource Assessment
  - Local outfitter/camping stores
  - Internet Web sites

- *Index Map of Topographic Sheets*

- Publication order form

TOPO MAP EXERCISE
(Part 1)

- What is the name of this particular quadrangle?

  Marble Hill

- What quadrangle is SOUTH of this quad?

  Dongola

- What quadrangle is SOUTHWEST of this quad?

  Zalma

RELIEF

- Relief is the variation in elevation of the Earth's surface
- Illustrated by *contour lines*
- *Contour lines* connect points of equal elevation

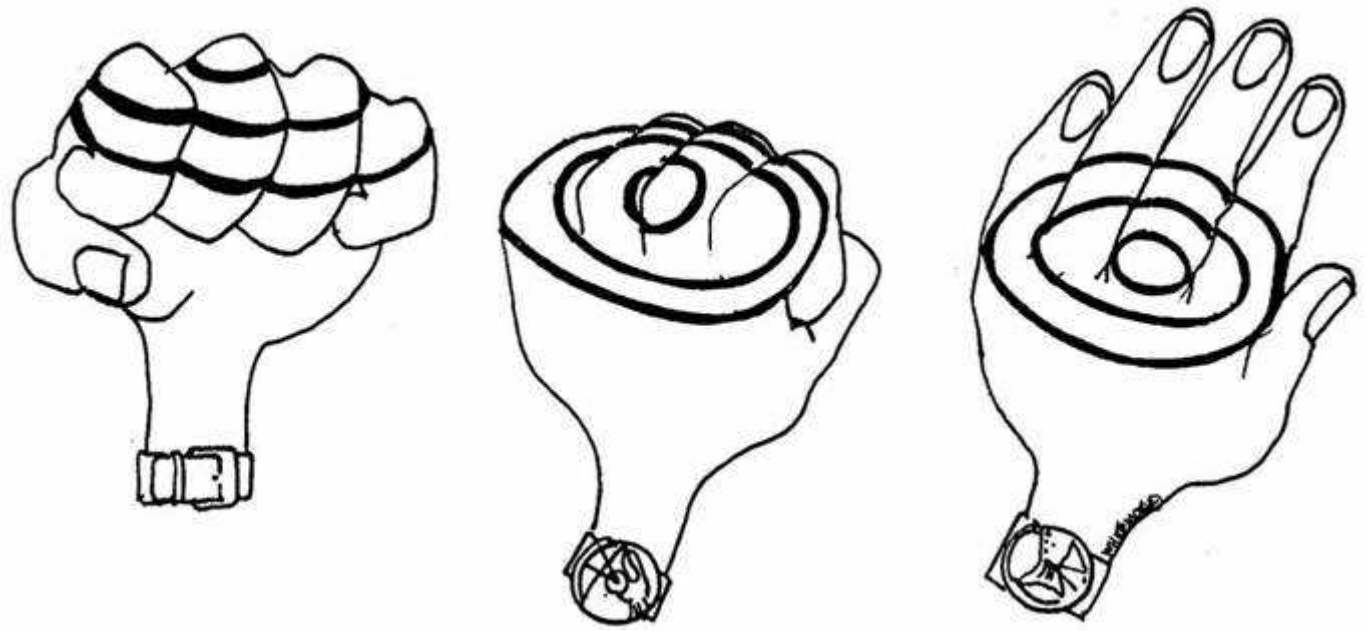
TOPO MAP EXERCISE
(Part 2)

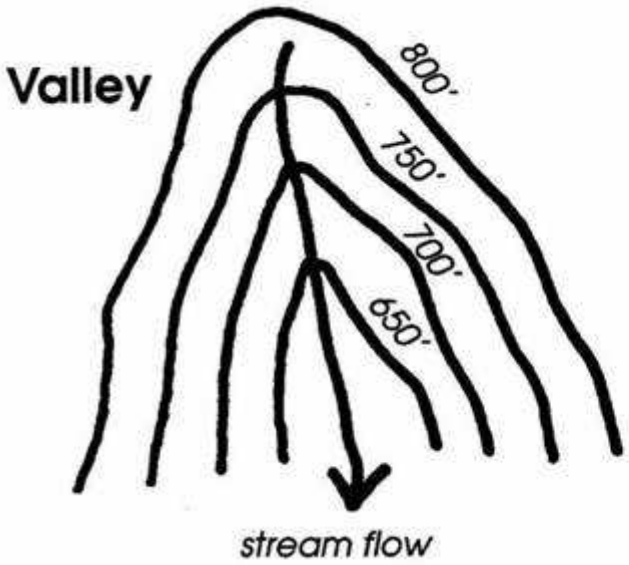
- What is the contour interval on this quadrangle?

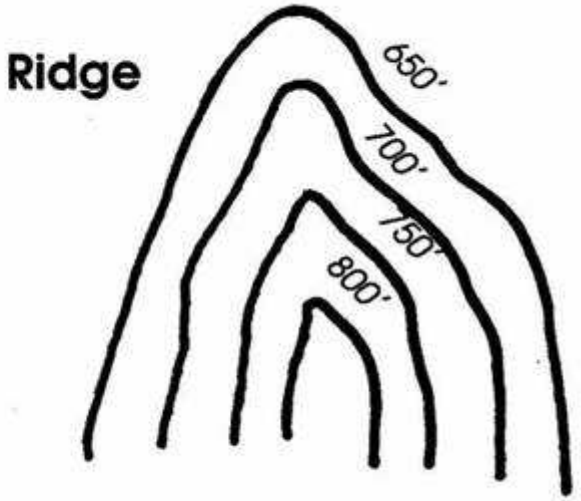
  20 feet

- Find the intersection of Highways 34 and 51 near the town of Marble Hill.
- Follow Hwy. 34 east (right) to the junction of Hwy. B.
- What is the elevation at the intersection of Highways 34 and B?

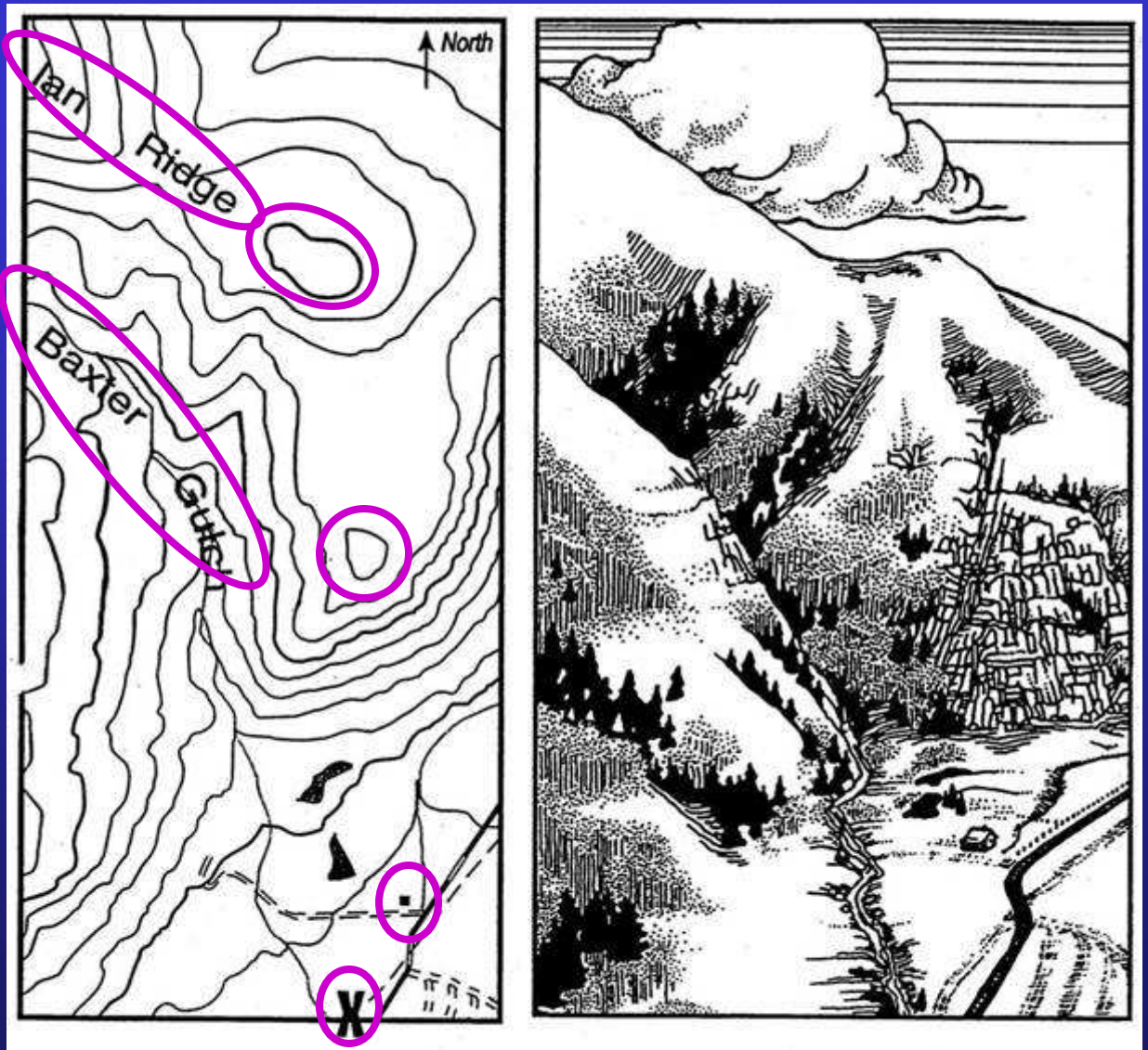
  Between 500 and 520 feet




Valley
800'
750'
700'
650'
stream flow


Ridge
650'
700'
750'
800'

TRANSLATING THE TOPO MAP TO REAL LIFE



Standing at the "X" on the topo map (above left), someone looking north would see the scene depicted above, right, including the secondary highway, streams, house, unfinished roads, ponds, and mountain ridges.

SCALE

- Represents distance or size
- Expressed as a ratio
- Different scales apply to different size quad maps
- We use the most detailed USGS map series: 7.5-minute quads
- Scale on these = 1:24,000
  Where 1 inch = 24,000 inches (2,000 feet)

TOPO MAP EXERCISE
(Part 3)

- What is the distance between the Shell and Eaker Cemeteries, south of Marble Hill?

  About 1 mile

- Cedar Branch is a tributary to what stream?

  Hurricane Creek

- What direction is Hurricane Creek flowing?

  South

TOPO MAP EXERCISE
(Part 3)

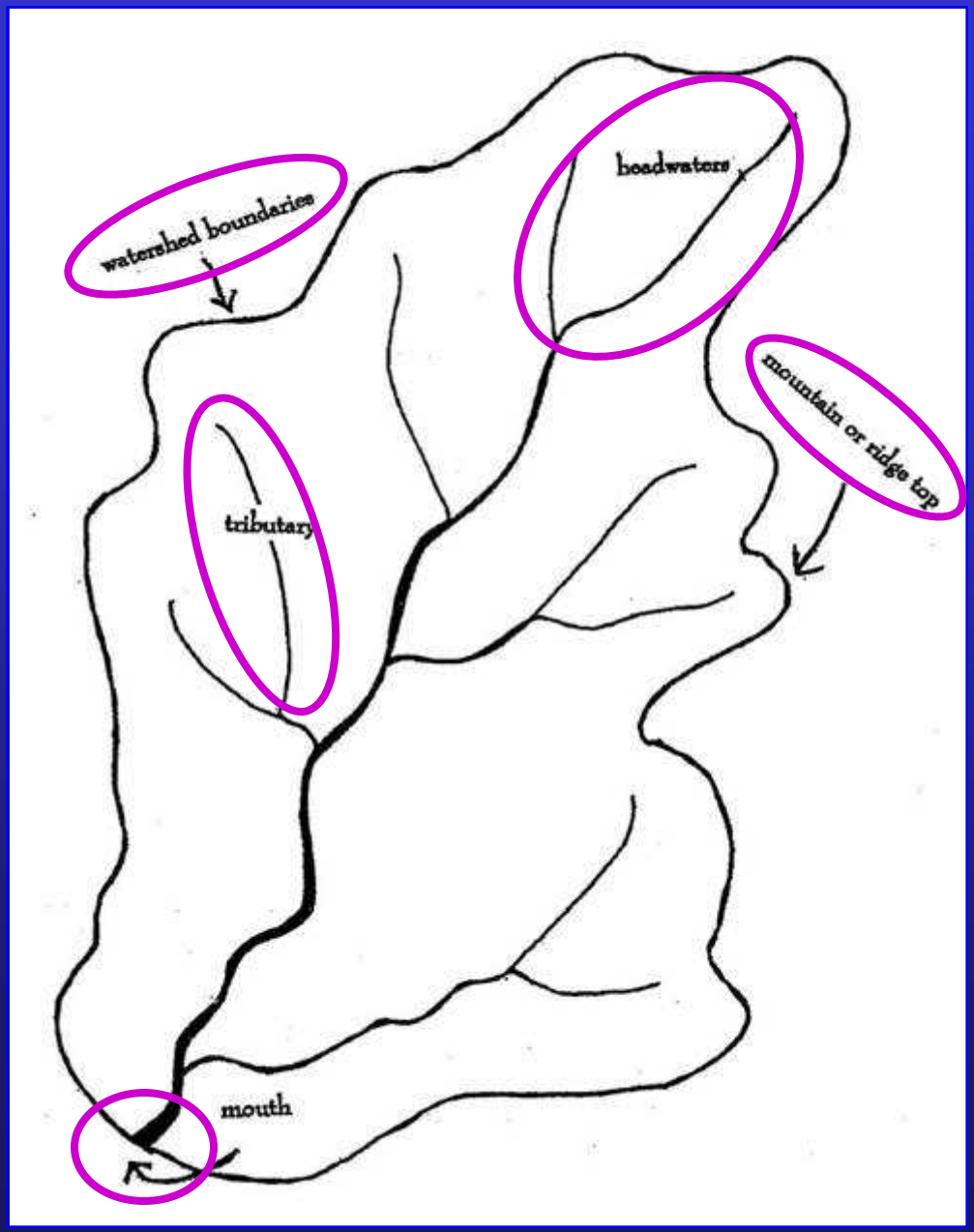
- Write a site description of the site marked with an “X” near the town of Marble Hill

TOPO MAP EXERCISE
(Part 3)

Example of a good site description:

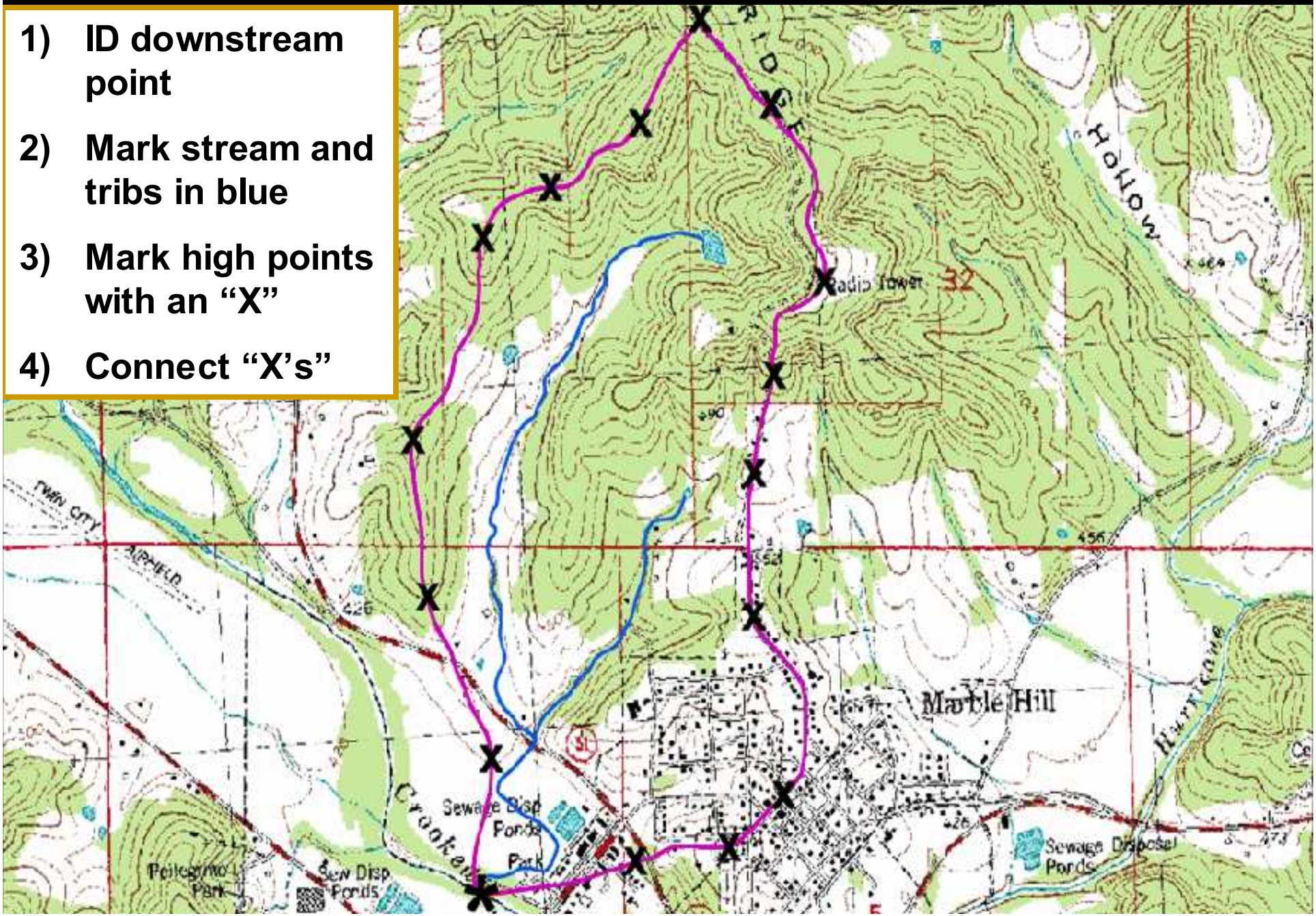
- Hurricane Creek, Bollinger County. 100 yards upstream of County Road 302

OUTLINE OF A WATERSHED



Watershed Boundary: Unnamed Tributary to Crooked Creek

1) ID downstream point
2) Mark stream and tribs in blue
3) Mark high points with an "X"
4) Connect "X's"

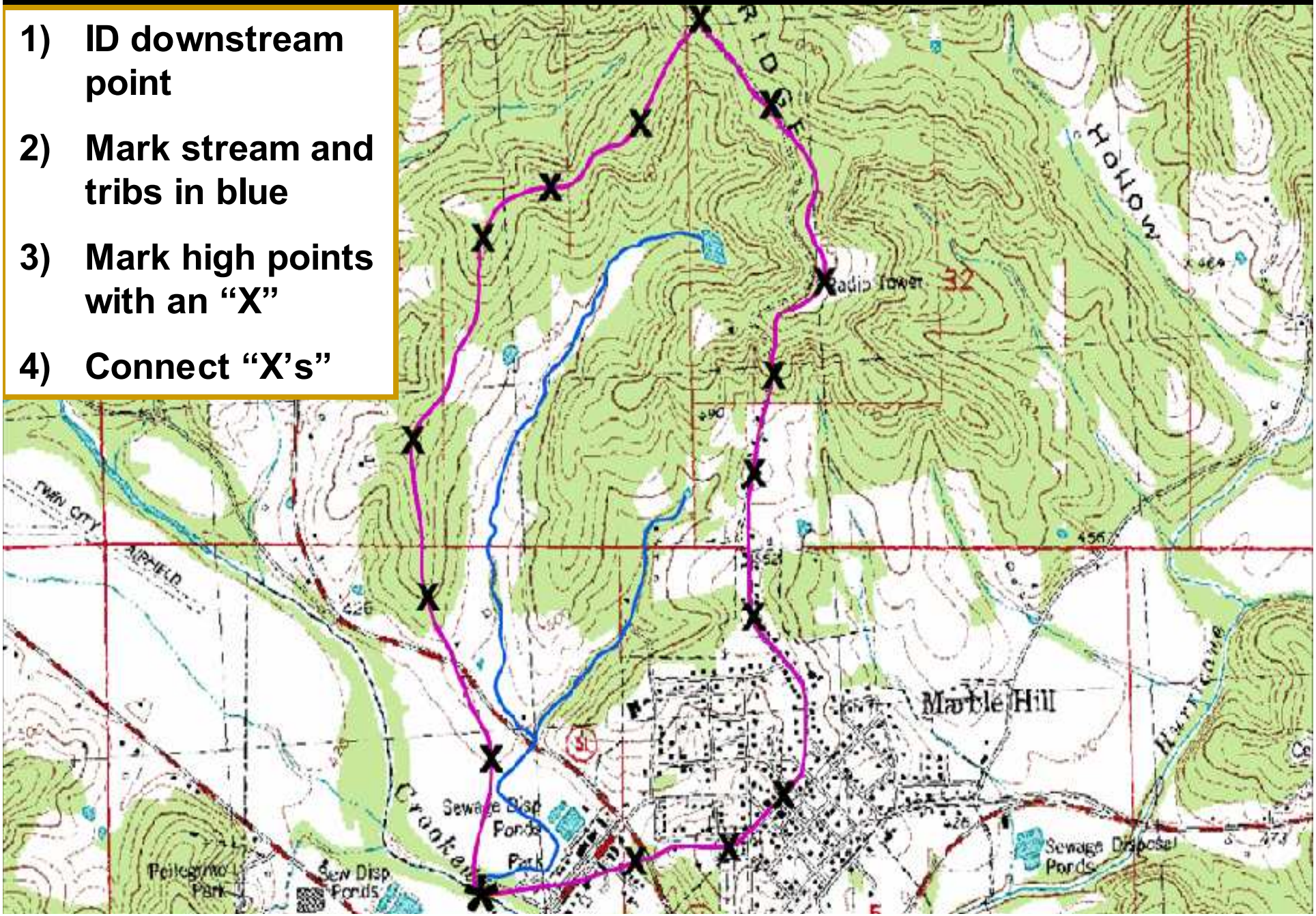


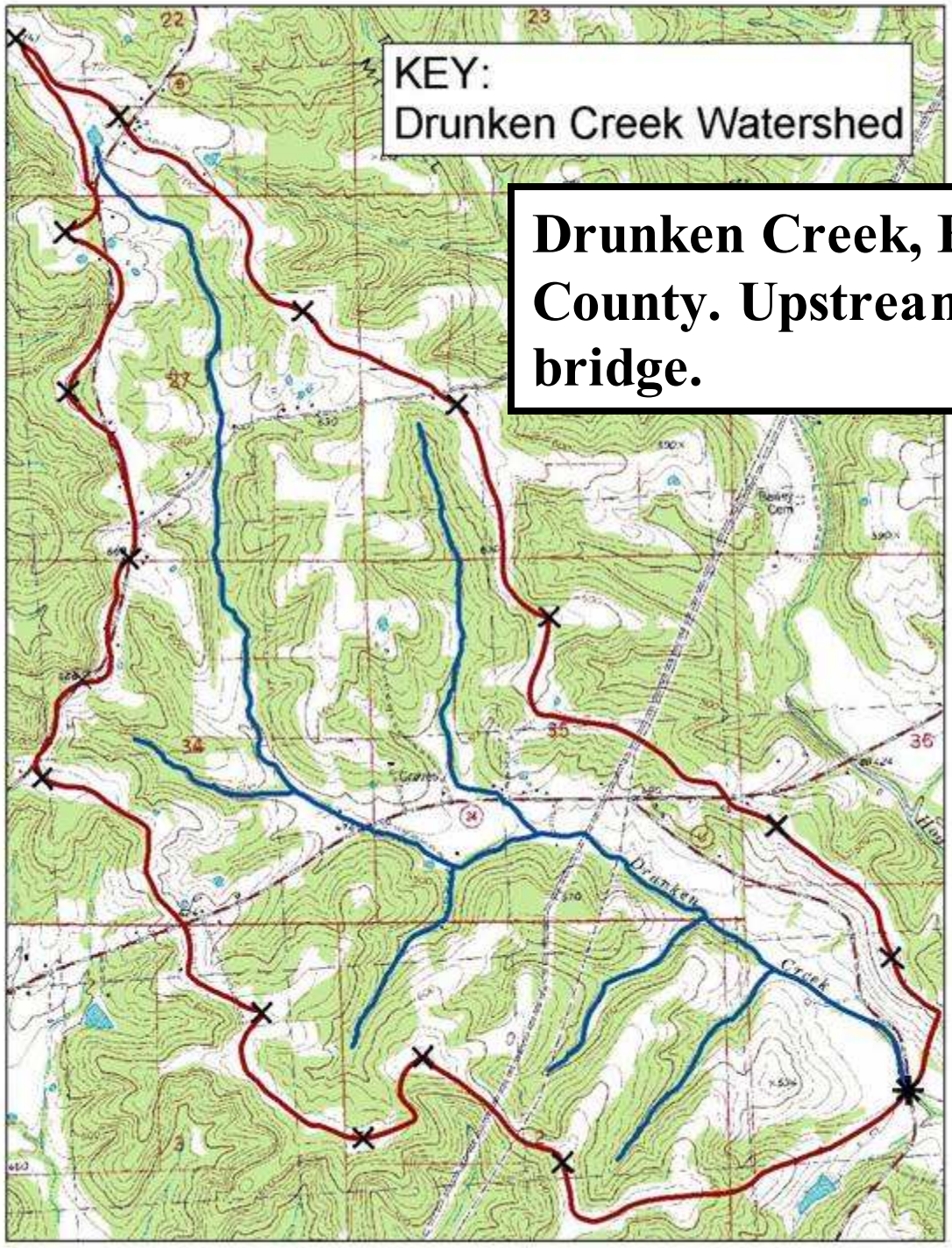
DRUNKEN CREEK WATERSHED EXERCISE

- This exercise should take about 10 minutes
- Find the “X” on Drunken Creek and map the watershed upstream from that sampling location
- The previous *Watershed Boundary* map will be displayed to remind you of the delineation process

Watershed Boundary: Unnamed Tributary to Crooked Creek

1) ID downstream point
2) Mark stream and tribs in blue
3) Mark high points with an "X"
4) Connect "X's"





Drunken Creek, Bollinger County. Upstream of Hwy U bridge.

Watershed map showing major land uses

Legend:

Forest

Agricultural fields

Pasture

Town and park

STREAM TEAM INVENTORY GUIDE

INVENTORY YOUR ADOPTED STREAM AND . . .

LEARN ABOUT YOUR STREAM'S HEALTH

IDENTIFY PROBLEMS THAT MAY NEED WORK

UNDERSTAND MORE ABOUT STREAMS IN GENERAL

MISSOURI STREAM TEAM

♦ EDUCATION ♦ STEWARDSHIP ♦ ADVOCACY ♦